MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 1587
MSDS Number: 1587
SRM Name: Nitrated Polycyclic Aromatic Hydrocarbons in Methanol

Date of Issue: 04 February 2005

MSDS Coordinator: Mario Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: Standard Reference Material (SRM) 1587 consists of four vials, each containing 1 mL of a methanol solution of seven nitrated polycyclic aromatic hydrocarbons (N-PAHs)[1].

Substance: Methanol

Other Designations: **Methanol** (methyl alcohol; wood alcohol; methyl hydroxide; carbinol; monohydroxymethane; wood spirit; wood naphtha; methylol)

[1] The total concentration of the PAHs in this material is less than 0.1 %, which is below the reportable limit (0.1 % for chemicals identified as carcinogens) required by OSHA according to 29 CFR 1910.1200 (g)(2)(i)(C)(1) for individual MSDS information. For the list and actual concentration of these compounds, refer to the corresponding Certificate of Analysis.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	**Methanol**
CAS Number:	67-56-1
EC Number (EINECS):	200-650-6
SRM Nominal Concentration (mass %):	> 99
EC Classification:	F, T
EC Risk (R No.):	11, 23, 24, 25, 39
EC Safety (S No.):	1, 2, 7, 16, 36, 37, 45

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 3 Reactivity = 0

Major Health Hazards: Skin and eye irritation. Central nervous system depression. Nerve damage.

Target Organs: Nervous system.

Physical Hazards: Flammable liquid and vapor. Vapor may cause a flash fire.

Potential Health Effects
Inhalation: Inhalation (acute exposure) of methanol may cause irritation of the mucous membranes, coughing, oppression in the chest, and bronchitis. Metabolic acidosis and effects on the eyes and central nervous system may also occur. Repeated or prolonged exposure (chronic exposure) may cause effects as in acute ingestion. Repeated exposure to 200 ppm to 375 ppm caused recurrent headaches in workers.

Skin Contact: Skin contact with methanol may cause irritation. Skin absorption may occur and cause metabolic acidosis and effects on the eyes and the central nervous system. Repeated or prolonged contact may cause defatting of the skin resulting in erythema, scaling, and exzematoid dermatitis.

Eye Contact: Eye contact with methanol vapors may cause irritation. Repeated or prolonged contact may cause conjunctivitis.

Ingestion: Ingestion of methanol may cause mild and transient subsequent drowsiness and inebriation. A symptomatic period may follow lasting 4 to 48 hours. Symptoms included headache, vertigo or dizziness, nausea, vomiting, and violent pain in the back, abdomen, and extremities. Effects on the eyes may included optic neuritis, blurred vision, dilated, unresponsive pupils, eye pain, and change in color perception. Partial or permanent blindness my occur. As little as 15 mL has caused blindness. Repeated ingestion may cause systematic effects described in acute ingestion along with blindness or visual impairment.

Listed as a Carcinogen/ Potential Carcinogen:

Yes	No	
	X	In the National Toxicology Program (NTP) Report on Carcinogens.
	X	In the International Agency for Research on Cancer (IARC) Monographs.
	X	By the Occupational Safety and Health Administration (OSHA).

4. First Aid Measures

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration by qualified personnel. Obtain medical assistance if necessary.

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Ingestion: If ingested, wash out mouth with water. Obtain medical assistance immediately.

5. Fire Fighting Measures

Fire and Explosion Hazards: Methanol is a severe fire and explosion hazard when exposed to heat or flame. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back. Vapor and air mixtures are explosive.

Extinguishing Media: Use alcohol-resistant foam, dry chemical, carbon dioxide, or water spray.

Fire Fighting: Move container from fire area if it can be done without risk. **DO NOT** use high-pressure water streams which could scatter spilled material. Use water spray to cool containers until well after the fire is out and to discharge vapors. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): 11 (52 °F)
Method Used: Closed cup.

Autoignition Temp. (°C): 385 (725 °F)

Flammability Class (OSHA): IB

Flammability Limits in Air
UPPER (Volume %): 36.0
LOWER (Volume %): 6.0

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Avoid heat, flames, sparks, and other sources of ignition. Reduce vapors with water spray. Collect small spilled material after absorbing with sand or other non-combustible material in an appropriate container for disposal. For large spills, stop leak if possible without personal risk. Remove sources of ignition. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to the Release Quantity (RQ).

Reportable Quantity: Methanol is subject to reportable quantities (RQ) under Title III of SARA, which is greater than the unit quantity provided for SRM 1587. See Section 15, "Regulatory Information".

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. Subject to storage regulations U.S. OSHA 29 CRF 1910.106. Refer to SRM 1587 Certificate of Analysis for storage of SRM 1587.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: **Methanol**

OSHA (PEL): 260 mg/m^3 (200 ppm) TWA
NIOSH: 260 mg/m^3 (200 ppm) (10 h) recommended TWA (skin)
NIOSH: 325 mg/m^3 (250 ppm) recommended STEL (skin)
OES UK: 266 mg/m^3 (200 ppm) TWA (skin)
OES UK: 333 mg/m^3 (250 ppm) STEL (skin)

Ventilation: Use local exhaust ventilation system. Ensure compliance with applicable exposure limits. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present.

Respirator: If necessary, refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.

Eye Protection: Wear safety goggles. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near areas of use.

Personal Protection: Wear appropriate protective clothing and chemically resistant gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component:	**Methanol**
Appearance and Odor:	Clear liquid. Colorless. Alcohol odor.
Relative Molecular Weight:	32.04 g/mol
Molecular Formula:	CH_3OH
Boiling Point:	65 °C (149 °F)
Freezing Point:	–94 °C (–137 °F)
Volatility:	100 % by volume
Density:	0.7914 g/cm^3
Water Solubility:	Soluble.
Solvent Solubility:	Soluble in ether, benzene, alcohol, acetone, chloroform, ethanol, ketones, and organic solvents.
Odor Threshold:	100 ppm

10. STABILITY AND REACTIVITY

Stability: X Stable ____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

Incompatible Materials: Halo carbons, combustible materials, metals, oxidizing materials, halogens, metal carbide, bases, acids, and amines.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of carbon and various organic fragments.

Hazardous Polymerization: ____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Toxicity Data: Human, Inhalation TC_{LO}: 86 000 mg/m^3
Human, Oral LD_{LO}: 143 mg/kg
Man, Oral TD_{LO}: 3 429 mg/kg

Health Effects (Acute and Chronic): See Section 3: "Hazards Identification" for potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data

Fish Toxicity: Gudgeon (Gobio gobio) LC_{50} (mortality): 74.3 µg/L (96 h)

Invertebrate Toxicity: Water flea (Daphnia magna) EC_{50} (immobilization): 383 µg/L (48 h)

Algal Toxicity: Algae, photoplankton, algal mat (population): 200 µg/L to 480 µg/L (8 h)

Phototoxicity: Eelgrass (Zostera marina) (biochemical): 0.1 µg/L (21 weeks)

Other Toxicity: Aquatic community (chlorophyl): 3.2 µg/L (3 days to 21 days)

Environmental Summary: Highly toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations, U.S. EPA 40 CFR 262, Hazardous Waste Number U154.

14. TRANSPORTATION INFORMATION

U.S. DOTand IATA: Methanol; UN1230; Hazard Class 3; Packing Group II.

Canadian Transportation of Dangerous Goods: Methanol; UN1230; Hazard Class 3; Packing/Risk Group II.

Land Transport ADR and RID: Methanol; UN1230; Hazard Class 3; Packing Group II.

Maritime Transport: Methanol; UN1230; Hazard Class 3; Packing Group II.

15. REGULATORY INFORMATION

U.S. Regulations: CERCLA Sections 102a/103 (40 CFR 302.4): Methanol: 2268 kg (5000 lbs).

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Methanol.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes.
CHRONIC:	Yes.
FIRE:	Yes.
REACTIVE:	No.
SUDDEN RELEASE:	No.

State Regulations: California Proposition 65: Not regulated.

CANADIAN Regulations

WHMIS Classification: Not determined.

EUROPEAN Regulations

EC Classification (assigned):	F	Highly Flammable.
	T	Toxic.
EC Risk Phrases:	R11	Highly flammable.
	R23, 24, 25	Toxic by inhalation, in contact with skin, and if swallowed.
	R39, 23, 24, 25	Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
EC Safety Phrases:	S1,2	Keep locked up and out of reach of children.
	S7	Keep container tightly closed.
	S16	Keep away from sources of ignition. No smoking.
	S36, 37	Wear suitable protective clothing and gloves.
	S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

National Inventory Status

U.S. Inventory (TSCA): Listed on inventory.

TSCA 12(b) Export Notification: Not listed.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Methyl Alcohol*, 16 September 2004.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.